

Remarks

Status of Claims

Claims 92 has been cancelled without prejudice or disclaimer. Upon entry of the current amendment claims 1-9, 12-14, 18-21, 50, 53-56, 58-60, 62-65, 67-69, 71, 73, 75, 77, 79-82, 85-91 and 93-100 are pending. Claims 1, 2, 3, 4, 14, 54, 55, 56, 60, 64, 65, 69, 71, 75, 77, 79, 80-82, 85-91, 93-96, 99 and 100 have been amended. Claims 101 and 102 are newly added.

Claim Amendments

Claim 1 has been amended to clarify that the chamber comprises three regions, and the designation of the regions are clarified to correspond with those in the specification and abstract. Also claim 1 has been amended to recite that the apertures of the top wall are located above and adjacent to the third region located between the second region and first region.

Claim 2 has been amended to recite that the third region is not sealed while either the second and first regions are sealed or the third region is not sealed while the second and first regions are both sealed. Support can be found in paragraph 20 and 45 of the specification as filed.

Claim 3 has also been amended to recite “electrochemically ionizable conducting material” as suggested by the Examiner.

Claim 4 has also been amended to recite “electrochemically ionizable conducting material” as suggested by the Examiner.

Claim 14 has also been amended to recite “two or more rows” as suggested by the Examiner.

Claim 54 has also been amended to recite “ionizable metal” as suggested by the Examiner.

Claim 55 has also been amended to recite “ionizable metal” as suggested by the Examiner.

Claim 56 has also been amended to correct claim dependency and thereby recite that claim 56 depends from method claim 94.

Claim 60 has also been amended to recite “two or more rows” as suggested by the Examiner.

Claim 64 has also been amended to recite “the electrochemically ionizable metal” as suggested by the Examiner.

Claim 69 has also been amended to recite “two or more rows” as suggested by the Examiner.

Claim 71 has been amended to clarify that the chamber comprises three regions, and the designation of the regions are clarified to correspond with those in the specification and abstract. Also claim 1 has been amended to recite that the apertures of the top wall are located above and adjacent to the third region located between the second region and first region.

Claim 75 has been amended, as suggested by the Examiner, to clarify that the method of claim 71 further comprises a degradation step and that the anode being degraded during the application of the electric field comprises an electrochemically ionizable conducting material.

Claim 77 has been amended, to also recite that the gel comprises one or more wells and the gel is contained within a disposable cassette.

Claim 79 has been amended to correct claim dependency and to correct antecedent basis with respect to the step of degrading the anode.

Claim 81 has also been amended to recite “electrochemically ionizable conducting material” as suggested by the Examiner.

Claims 85-91 and 93 have been amended to replace “cassette” with “disposable cassette”.

Claim 94 has been amended to recite that the third region is not sealed while either the second and first regions are sealed or the third region is not sealed while the second and first regions are both sealed. Support can be found in paragraphs 20 and 45 of the specification as filed.

Claims 95, 96 and 99 have been amended to replace “device” with “disposable cassette”.

Claims 99 and 100 have been amended to replace “planar” with “flat”.

Claims 56, 65, 80, 82 and 90 have been amended to clarify TBE as Tris-Borate EDTA.

Claim 101 is newly added with support for the comb found in the specification at paragraph 91.

Claim 102 is newly added with support for the bottom wall being flat found in the Figures 2, 4, 6 and 8.

Claim Objections

Claim 92 was objected to under 37 CFR 1.75(c) as allegedly being improper dependent form for failing to further limit the subject matter of the claim which it depends. Claim 92 has been cancelled herein without prejudice or disclaimer. Accordingly the objection is rendered moot.

Claims 1, 3, 4, 14, 54, 55, 60, 64, 69, 71, 75 and 81 were objected to because of informalities. Claims 1, 3, 4, 14, 54, 55, 60, 64, 69, 71, 75 and 81 have been amended to correct these informalities. Accordingly, the Applicants respectfully request the objections be withdrawn.

Claim Rejection - 35 U.S.C. §103

Tocci (U.S. Patent No. 3,715,295) in view of Elson (U.S. Patent No. 3,888,759)

The Office Action, mailed January 3, 2007, rejected claims 1-4, 62, 71, 85-87, 91 and 94-100 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci in view of Elson *et al.* The requirement for establishing a *prima facie* case of obviousness under 35 U.S.C. §103(a) include the following: 1) each and every element of the claimed invention must be taught or suggested by the cited reference: 2) there must be a suggestion or motivation to combine the cited references; and 3) one of ordinary skill in the art must have a reasonable expectation of success in combining or modifying the teachings of the cited reference to arrive at the claimed invention. (MPEP 2142).

The Office Action asserts that Tocci discloses a disposable electrophoresis cassette having a top, bottom, side and end walls, wherein the bottom wall is contiguous and the chamber comprises three regions, an electrophoresis area, a gel matrix within the chamber comprising an electrolyte and an anode and cathode disposed in respective

sealed regions. However, the Office Action concedes that Tocci does not explicitly disclose a unit comprising apertures for sample loading or wells disposed below the apertures. The Office Action asserts that Elson *et al.* discloses a gel cassette wherein samples are applied into wells formed in the gel through apertures provided in the top wall of the gel cassette. The Office Action further asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the unit of Tocci by providing a row of apertures in the top wall for sample loading, as taught by Elson *et al.*, because Elson *et al.* teaches the advantages of this design, in that it allows for a range of sample volumes and allows samples to be applied without opening the instrument.

The Applicants respectfully disagree with these assertions and respectfully assert that there is no suggestion or motivation to combine Tocci and Elson *et al.* because there would be no benefit in using the top wall of Elson *et al.* with the electrophoresis unit of Tocci.

The Office Action asserts that the motivation to modify the electrophoresis unit of Tocci with the top wall of Elson *et al.* is provided by the range of sample volumes allegedly made possible by the Elson *et al.* device, as well as the ability to apply samples without opening the instrument. However, the Applicants respectfully assert that these alleged teachings of Elson *et al.* would not motivate a skilled artisan to modify the electrophoresis unit of Tocci to include one or more apertures for sample loading into one or more wells disposed below the apertures because these teachings would not provide an advantage to the electrophoresis unit and corresponding method disclosed in Tocci. This conclusion is based on the teaching in Tocci that prior to covering the tank containing the semi-solid buffer and the separation medium with a lid, the following steps are performed (see col. 2, lines 31-36; col. 3, lines 15-17):

- a) the tank reservoirs are filled with semi-solid buffer or a pre-packaging seal (a plastic or metal foil) is removed to expose the semi-solid buffer pre-packaged in the tank reservoirs;
- b) the separation medium is positioned on top of the tank whereby the separation medium is in contact with reservoirs positioned below the separation medium,

- c) a buffer is optionally spread over the support medium, for example using a wiper or by blotting with a towellette and
- d) the sample to be separated or identified is applied to the separation medium.

Accordingly, the Applicants assert that the electrophoresis unit of Tocci requires the top wall (i.e. lid) be removed, (i.e the instrument be opened) in order to perform the steps listed above. Therefore, there is no benefit or advantage to adding apertures in the lid of the electrophoresis unit of Tocci for sample loading because, according to Tocci, the lid is not in place at the time of loading samples, and therefore a researcher has access to the support medium, for loading a sample. Thus one having ordinary skill in the art at the time the invention was made would not be motivated to use the top wall of Elson *et al.*, which allegedly includes one or more apertures to load samples into wells disposed below the apertures, to achieve the advantage of applying samples without opening the unit as asserted by the Office Action.

The Applicants respectfully assert that Tocci teaches away from being combined with Elson *et al.* to obtain the device disclosed therein with the top wall of Elson *et al.*. Tocci describes that, at the time the invention of Tocci was made, one of the problems associated with electrophoresis units was evaporation of liquid buffers resulting in loss of effectiveness due to pH changes and changes in tonicity due to increases salt production (see col. 1, lines 35-37). Tocci does not disclose that the problem of evaporation is overcome by the electrophoresis unit disclosed by Tocci. Conversely, Tocci states that “In FIG. 3 a lid 5 is illustrated in position upon the chamber 1 to effectively enclose the chamber to air to avoid substantial evaporation therefrom” (see col. 4, lines 55-57 emphasis added). In addition, Tocci discloses the use of a lid “to close the tank to the atmosphere” (see col. 3, lines 25-30; col.6, lines 12-17). Thus, Tocci uses a lid to close the tank or chamber from the atmosphere to avoid evaporation. Therefore there is no suggestion or motivation to combine the top wall of Elson *et al.* with the electrophoresis unit of Tocci as the lid of Elson *et al.* with the apertures would only increase evaporation.

Furthermore, the Applicants respectfully assert that there is no reasonable expectation of success in combining the top wall of Elson *et al.* with the electrophoresis unit of Tocci to provide a disposable cassette that can be used to successfully perform electrophoresis using an electrophoresis gel because Tocci does not provide any data

showing successful separations with any separation medium, and specifically Tocci does not provide any data showing successful electrophoretic separations using an electrophoresis gel separation medium. Furthermore, Tocci does not provide any data showing successful application of any semi-solid buffer to achieve successful electrophoretic separation.

In addition, there is no reasonable expectation of success in combining the top wall of Elson *et al.* with the electrophoresis unit of Tocci to provide a disposable cassette that can be used to successfully perform electrophoresis using an electrophoresis gel. Tocci does not teach that samples are loaded into wells in a separation medium, or that the support medium has wells for sample loading. Tocci states (emphasis added, see col. 3, lines 57-59):

“...the test sample, which is subject to electrophoretic particle separation, is deposited on the buffered support media.”

The Applicants respectfully assert that to achieve successful electrophoretic separation using an electrophoresis gel, the samples must be loaded into wells in the electrophoresis gel. Then, upon application of an electric field the samples components migrate through the gel and separate based on differences in charge and/or size. Therefore, the samples, as loaded by Tocci, could not be successfully separated by gel electrophoresis because they would be on top of the electrophoresis gel and thereby be unable to interact with the electrophoresis gel during migration upon application of the electric field.

Therefore, there would be no advantage in using a top wall with a row of apertures, as disclosed by Elson *et al.*, to cover and load sample onto a support medium as disclose by Tocci, because there is no reasonable expectation of success that the samples would be effectively loaded to allow for successful electrophoretic separation.

With respect to claims 2-4, 62, 85-87, 91 and 94-100, which depend from either independent claim 1 or 71, which recite a top wall comprising one or more apertures and one or more wells located below the one or more apertures, the combination of Tocci and Elson *et al.* does not render these dependent claims obvious either.

Specifically, with respect to claims 2 and 94 the Applicants respectfully assert, and the Office Action concedes, that Tocci discloses all regions are sealed before and during electrophoresis. Claims 2 and 94 have been amended to recite that the third region in the disposable cassette of the Applicants is not sealed, while the first and second regions can both be sealed, or either the first or second regions can be sealed. Thus, Tocci does not disclose the disposable cassette of the Applicant and therefore the combination of Tocci and Elson *et al.* does not render claims 2 and 94 obvious.

Claims 99 and 100 have been amended to recite that the bottom wall of the disposable cassette of the Applicants is flat. The bottom wall of the electrophoresis unit of Tocci is not flat and therefore Tocci does not disclose the disposable cassette of the Applicant. Thus, the combination of Tocci and Elson *et al.* does not render claims 99 and 100 obvious.

Accordingly, the Applicant respectfully request that the rejection of claims 1-4, 62, 71,85-87, 91 and 94-100, under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci in view of Elson *et al.* be withdrawn.

Tocci (U.S. Patent No. 3,715,295) and Elson et al. (U.S. Patent No. 3,888,759) in view of Pace (U.S. Patent No. 4,908,112)

The Office Action, mailed January 3, 2007, rejected claims 5, 6, 63, 64, 75, and 88 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci and Elson *et al.* in further view of Pace.

The Office Action refers to its assertions regarding Tocci and Elson *et al.* as applied to claims 1-4, 62, 71,85-87, 91 and 94-100, but concedes that neither Tocci nor Elson *et al.* explicitly disclose any specific metals for the electrodes. The Office Action asserts that Pace discloses an electrophoresis device with copper or silver electrodes and asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Tocci by using copper or silver electrodes, as taught by Pace, because it would reduce the cost of manufacture and would only be a matter of choice. In addition, with respect to claims 75 and 88, the Office Action asserts that if copper or silver is used for the anode, metal ions will

preferentially form rather than water hydrolysis products and will be present in the gel matrix, thereby meeting the limitation of the claims.

The Applicants respectfully assert that, as presented above, Tocci and Elson *et al.* do not disclose a disposable cassette as recited in pending claims 1-4, 62, 71,85-87, 91 and 94-100. More specifically, Tocci does not disclose one or more apertures in the top wall of their electrophoresis unit, or a gel matrix having one or more wells located below the apertures. Pace does not provide these missing elements. Pace provides at most two embodiments of the capillary electrophoresis device, neither of which includes an electrophoresis gel matrix having one or more wells located below apertures in a top wall. Furthermore, Pace does not disclose a device having three regions, one region that includes the apertures and is located between a second region and a first region, wherein the second region and the first region include an electrode.

In summary, the deficiencies of Tocci are not remedied by Pace. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claims 5, 6, 63, 64, 75, and 88 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tocci and Elson *et al.* in further view of Pace.

Tocci (U.S. Patent No. 3,715,295) and Elson et al. (U.S. Patent No. 3,888,759) in view of Eibl et al. (U.S. Patent No. 3,951,776)

The Office Action, mailed January 3, 2007, rejected claims 7-9 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tocci and Elson *et al.* in further view of Eibl.

The Office Action refers to its assertions regarding Tocci and Elson *et al.* as applied to claims 1-4, 62, 71,85-87, 91 and 94-100, but concedes that neither Tocci nor Elson *et al.* explicitly disclose any specific metals for the electrodes. The Office Action asserts that Eibl *et al.* disclose an electrophoresis device with aluminum electrodes and asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Tocci by using aluminum electrodes, as taught by Eibl *et al.*, because it would reduce the cost of manufacture and would only be a matter of choice. In addition, with respect to claims 7 and 9, the Office Action asserts that although Eibl *et al.* do not specifically address the oxygen-absorbing

abilities of aluminum, this is an innate property of the metal and would allow for the gel to remain substantially oxygen-free, even if water electrolysis did occur.

The Applicants respectfully assert that, as presented above, Tocci and Elson *et al.* do not disclose a disposable cassette as recited in pending claims 1-4, 62, 71,85-87, 91 and 94-100. More specifically, Tocci does not disclose one or more apertures in the top wall of their electrophoresis unit, or a gel matrix having one or more wells located below the apertures. Eibl *et al.* do not provide these missing elements. Eibl *et al.* provide an electrophoresis apparatus that uses aluminum electrodes, but does not provide a disposable cassette having one or more apertures in a top wall. Furthermore, Eibl *et al.* do not disclose a device having three regions, one region that includes the apertures and is located between a second region and a first region, wherein the second region and the first region include an electrode.

In summary, the deficiencies of Tocci are not remedied by Eibl *et al.*. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claims 7-9 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci and Elson *et al.* in further view of Eibl *et al.*.

Tocci (U.S. Patent No. 3,715,295) and Elson et al. (U.S. Patent No. 3,888,759) in view of Flesher et al. (U.S. Patent No. 4,773,984)

The Office Action, mailed January 3, 2007, rejected claims 19-21 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci and Elson *et al.* in further view of Flesher *et al.*

The Office Action refers to its assertions regarding Tocci and Elson *et al.* as applied to claims 1-4, 62, 71,85-87, 91 and 94-100, but concedes that neither Tocci nor Elson *et al.* explicitly disclose any specific metals for the electrodes. The Office Action asserts that Flesher *et al.* discloses an electrophoresis device with palladium electrodes and asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Tocci by using palladium electrodes, as taught by Flesher *et al.*, because they are highly resistive to corrosion and would only be a matter of choice. In addition, with respect to claims 19 and 21, the Office Action asserts that although Flesher *et al.* do not specifically address the

hydrogen-absorbing abilities of palladium, this is an innate property of the metal and would allow for the gel to remain substantially hydrogen-free, even if water electrolysis did occur.

The Applicants respectfully assert that, as presented above, Tocci and Elson *et al.* do not disclose a disposable cassette as recited in pending claims 1-4, 62, 71,85-87, 91 and 94-100. More specifically, Tocci does not disclose one or more apertures in the top wall of their electrophoresis unit, or a gel matrix having one or more wells located below the apertures. Flesher *et al.* do not provide these missing elements. Flesher *et al.* provide a vertical electrophoresis apparatus that can use palladium electrodes, but does not provide a disposable cassette having one or more apertures in a top wall. However, Flesher *et al.* do not disclose a device having three regions, one region that includes the apertures and is located between a second region and a first region, wherein the second region and the first region include an electrode.

In summary, the deficiencies of Tocci are not remedied by Flesher *et al.*. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claims 19-21 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci. and Elson *et al.* in further view of Flesher *et al.*.

Tocci (U.S. Patent No. 3,715,295) in view of Elson et al. (U.S. Patent No. 3,888,759) in further view of Day (UK Patent Application GB 2,284,484)

The Office Action, mailed January 3, 2007, rejected claims Claim 12-14 and 67-69 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci and Elson *et al.* in further view of Day.

The Office Action refers to its assertions regarding Tocci and Elson *et al.* as applied to claims 1-4, 62, 71,85-87, 91 and 94-100, but concedes that neither Tocci nor Elson *et al.* explicitly disclose spacing the apertures to conform with intervals between tips on a loader, or apertures in a stager format. The Office Action asserts that Day discloses an electrophoresis gel with sample wells spaced to match the spacing of standard multichannel pipettes and discloses staggered arrangement of wells. The Office Action further asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the combination of Tocci and

Elson *et al.* by spacing the sample application slots taught by Elson *et al.* to match the 9 mm spacing of multichannel pipettes, as taught by Day, because Day teaches the economy of time and labor in sample loading that such an arrangement allows. In addition, the Office Action asserts that it would have been obvious to one having ordinary skill in the art to provide multiple, staggered rows of sample wells, as taught by Day, because day teaches that this arrangement allows a much more efficient use of the gel space in that many more samples can be run in a single gel.

The Applicants respectfully assert that, as presented above, Tocci and Elson *et al.* do not disclose a disposable cassette as recited in pending claims 1-4, 62, 71,85-87, 91 and 94-100. More specifically, Tocci does not disclose one or more apertures in the top wall of their electrophoresis unit, or a gel matrix having one or more wells located below the apertures. As discussed above regarding the combination of Tocci and Elson *et al.*, the Applicants respectfully assert that there is no suggestion or motivation to combine Tocci and Elson *et al.* to obtain the Applicant's electrophoresis cassette because there would be no benefit in using Elson *et al.*'s lid with the electrophoresis unit of Tocci. The Applicants respectfully assert that when using the electrophoresis unit of Tocci the lid is required to be opened to allow positioning of the separation media prior to applying the sample. The disclosure of Day does not remedy the deficiencies of Tocci and Elson *et al.*, and nothing in Day changes the fact that Tocci teaches needing the lid off/open in order to gain access to position the separation medium on top of the tank wells containing the semi-solid buffer and to load the samples on the separation medium. This therefore renders useless using the lid of Elson *et al.* with or without the arrangement taught by Day.

In summary, the deficiencies of Tocci are not remedied by Elson *et al.* or Day either alone or in combination. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claims 12-14 and 67-69 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci. and Elson *et al.* in further view of Day.

Tocci (U.S. Patent No. 3,715,295) in view of Elson et al. (U.S. Patent No. 3,888,759) in further view of Monthony et al. (U.S. Patent No. 3,948,743)

The Office Action, mailed January 3, 2007, rejected claims 53, 56, 65, 79, 80, 81, 82, 89, 90, 92 and 93 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci and Elson *et al.* in further view of Monthony *et al.*

The Office Action refers to its assertions regarding Tocci and Elson *et al.* as applied to claims 1-4, 62, 71,85-87, 91 and 94-100, but concedes that neither Tocci nor Elson *et al.* explicitly disclose any particular buffer solution. The Office Action asserts that Monthony *et al.* discloses electrophoresis methods, one of which involves using a Tris-Glycine buffer for separations at pH 8.9. The Office Action asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Tocci by using the buffer system disclosed by Monthony *et al.* because Tocci did not disclose a specific buffer system.

The Applicants respectfully assert that, as presented above, Tocci and Elson *et al.* do not disclose a disposable cassette as recited in pending claims 1-4, 62, 71,85-87, 91 and 94-100. More specifically, Tocci does not disclose one or more apertures in the top wall of their electrophoresis unit, or a gel matrix having one or more wells located below the apertures. Monthony *et al.* do not provide these missing elements. Monthony *et al.* provide electrophoresis methods and buffers, but do not provide methods using a disposable cassette having one or more apertures in the top wall, or a gel matrix having one or more wells located below the apertures. Additionally, Monthony *et al.* do not disclose a device having three regions, one region that includes the apertures and is located between a second region and a first region, wherein the second region and the first region include an electrode.

With regards to the inherency of the properties of Tris/Glycine recited in pending claims 56, 65, 80, 82 and 90, the Applicants respectfully disagree with the application of the doctrine of inherency as set forth in the office Action on pages 13-14, where the doctrine is applied to support the alleged obviousness rejection. The Applicants respectfully assert that inherency, as a concept, is not properly applied in a rejection predicated on alleged obviousness (see, e.g., In re Shetty, 195 USPQ 753 (CCPA 1977); In re Spormann, 150 USPQ 449, 452 (CCPA 1966); and In re Adams, 148 USPQ 742

(CCPA 1966). In an obviousness rejection, an inherency argument cannot be based upon what was unknown in the art at the time the invention was made, even if the inherency of a certain feature is later established. *In re Rijckaert*, 9 F.2d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). The teaching or suggestion to make the claimed invention must be found in the prior art and not based on the Applicants' disclosure. MPEP 706.02 citing *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991).

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted).

Claim 92 is canceled herein, without prejudice or disclaimer. Accordingly, the rejection is moot with respect to this claim.

In summary, the deficiencies of Tocci and Elson *et al.* are not remedied by Monthony *et al.*. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claims 53, 56, 65, 79, 80, 81, 82, 89, 90, 92 and 93 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci and Elson *et al.* in further view of Monthony *et al.*.

Tocci (U.S. Patent No. 3,715,295) in view of Elson et al. (U.S. Patent No. 3,888,759) and Monthony et al. (U.S. Patent No. 3,948,743) in further view of Pace (U.S. Patent No. 4,908,112)

The Office Action, mailed January 3, 2007, rejected claims 54 and 55 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci, Elson *et al.* and Monthony *et al.* in further view of Pace.

The Office Action refers to its assertions regarding Tocci and Elson *et al.* and Monthony *et al.* as applied to claims 53, 56, 65, 79, 80, 81, 82, 89, 90, 92 and 93, and applied the same reasoning as that used for combining Tocci and Elson *et al.* with Pace and combining Tocci and Elson *et al.* with Monthony *et al.*. The Office Action concedes that neither Tocci nor Elson *et al.* explicitly disclose any specific metals for the electrodes and that neither Tocci nor Elson *et al.* explicitly disclose any particular buffer solution. However, the Office Action asserts that Monthony *et al.* discloses electrophoresis methods and buffers and Pace discloses an electrophoresis device with copper or silver electrodes. The Office Action further asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Tocci by using copper or silver electrodes, as taught by Pace, because it would reduce the cost of manufacture and would only be a matter of choice.

The Applicants respectfully assert that, as presented above, Tocci and Elson *et al.* and Monthony *et al.* do not disclose a disposable cassette as recited in pending claims 53, 56, 65, 79, 80, 81, 82, 89, 90, 92 and 93, and Pace does not provide the missing elements. Pace provides at most two embodiments of the capillary electrophoresis device, neither of which includes an electrophoresis gel matrix having one or more wells located below apertures in a top wall. Furthermore, Pace does not disclose a device having three regions, one region that includes the apertures and is located between a second region and a first region, wherein the second region and the first region include an electrode.

In summary, the deficiencies of Tocci and Elson *et al.* and Monthony *et al.* are not remedied by Pace. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claims 54 and 55 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci and Elson *et al.* and Monthony *et al.* in further view of Pace.

Tocci (U.S. Patent No. 3,715,295) in view of Elson et al. (U.S. Patent No. 3,888,759) and Monthony et al. (U.S. Patent No. 3,948,743) in further view of Eibl et al. (U.S. Patent No. 3,951,776)

The Office Action, mailed January 3, 2007, rejected claim 50 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci, Elson *et al.* and Monthony *et al.* in further view of Eibl *et al.*.

The Office Action refers to its assertions regarding Tocci and Elson *et al.* and Monthony *et al.* as applied to claims 53, 56, 65, 79, 80, 81, 82, 89, 90, 92 and 93, and applied the same reasoning as that used for combining Tocci and Elson *et al.* with Eibl *et al.* and combining Tocci and Elson *et al.* with Monthony *et al.*. The Office Action concedes that neither Tocci nor Elson *et al.* explicitly disclose any specific metals for the electrodes and that neither Tocci nor Elson *et al.* explicitly disclose any particular buffer solution. However, the Office Action asserts that Monthony *et al.* discloses electrophoresis methods and buffers and Eibl *et al.* disclose an electrophoresis device with aluminum electrodes. The Office Action further asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the device of Tocci by using aluminum electrodes, as taught by Eibl *et al.*, because it would reduce the cost of manufacture and would only be a matter of choice.

The Applicants respectfully assert that, as presented above, Tocci and Elson *et al.* and Monthony *et al.* do not disclose a disposable cassette as recited in pending claims 53, 56, 65, 79, 80, 81, 82, 89, 90, 92 and 93, and Eibl *et al.* do not provide the missing elements. Eibl *et al.* provide an electrophoresis apparatus that uses aluminum electrodes, but does not provide a disposable cassette having one or more apertures in a top wall. Furthermore, Eibl *et al.* do not disclose a device having three regions, one region that includes the apertures and is located between a second region and a first region, wherein the second region and the first region include an electrode.

In summary, the deficiencies of Tocci and Elson *et al.* and Monthony *et al.* are not remedied by Eibl *et al.*. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claim 50 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci and Elson *et al.* and Monthony *et al.* in further view of Eibl *et al.*.

Tocci (U.S. Patent No. 3,715,295) in view of Elson et al. (U.S. Patent No. 3,888,759) and Monthony et al. (U.S. Patent No. 3,948,743) in further view of Day et al. (UK Patent Application GB 2,284,484)

The Office Action, mailed January 3, 2007, rejected claims 58-60 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci, Elson *et al.* and Monthony *et al.* in further view of Day *et al.*.

The Office Action refers to its assertions regarding Tocci and Elson *et al.* and Monthony *et al.* as applied to claims 53, 56, 65, 79, 80, 81, 82, 89, 90, 92 and 93, and applied the same reasoning as that used for combining Tocci and Elson *et al.* with Day *et al.* and combining Tocci and Elson *et al.* with Monthony *et al.*. The Office Action concedes that neither Tocci nor Elson *et al.* explicitly disclose spacing the apertures to conform with intervals between tips on a loader, or apertures in a stager format and that neither Tocci nor Elson *et al.* explicitly disclose any particular buffer solution. However, the Office Action asserts that Monthony *et al.* discloses electrophoresis methods and buffers and Day *et al.* disclose an electrophoresis gel with sample wells spaced to match the spacing of standard multichannel pipettes and discloses staggered arrangement of wells. The Office Action further asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the combination of Tocci and Elson *et al.* by spacing the sample application slots taught by Elson *et al.* to match the 9 mm spacing of multichannel pipettes, as taught by Day, because Day teaches the economy of time and labor in sample loading that such an arrangement allows. In addition, the Office Action asserts that it would have been obvious to one having ordinary skill in the art to provide multiple, staggered rows of sample wells, as taught by Day, because day teaches that this arrangement allows a much more efficient use of the gel space in that many more samples can be run in a single gel.

The Applicants respectfully assert that, as presented above, Tocci and Elson *et al.* and Monthony *et al.* do not disclose a disposable cassette as recited in pending claims 53, 56, 65, 79, 80, 81, 82, 89, 90, 92 and 93, and Day *et al.* do not provide the missing elements. The disclosure of Day does not remedy the deficiencies of Tocci and Elson *et al.*, and nothing in Day changes the fact that Tocci teaches needing the lid off/open in order to gain access to position the separation medium on top of the tank wells containing

the semi-solid buffer, and to load the samples on the separation medium. This therefore renders useless using the lid of Elson *et al.* with or without the arrangement taught by Day.

In summary, the deficiencies of Tocci and Elson *et al.* and Monthony *et al.* are not remedied by Day *et al.*. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claims 58-60 under 35 U.S.C. §103(a) as allegedly being unpatentable over Tocci and Elson *et al.* and Monthony *et al.* in further view of Day *et al.*.

Pace (U.S. Patent No. 4,908,112) in view of Monthony et al. (U.S. Patent No. 3,948,743)

The Office Action, mailed January 3, 2007, rejected claim 77 under 35 U.S.C. §103(a) as allegedly being unpatentable over Pace in view of Monthony *et al.*.

The Office Action asserts that Pace discloses a method comprising the steps of applying an electric field to a gel through copper and silver electrodes, and that given a high enough voltage the release of anode ions instead of water electrolysis would be inherent. The Office Action concedes that Pace does not disclose any particular buffer. The Office Action asserts that Monthony *et al.* disclose an electrophoresis methods, one of which uses Tris-Glycine buffer for separations at pH 8.9. The Office Action further asserts that it would have been obvious to modify the device of Pace by using the buffer system disclosed by Monthony *et al.*, because Pace did not disclose a specific buffer.

Claim 77 has been amended to recite that the gel comprises one or more wells and that the gel is contained within a disposable cassette that comprises one or more apertures. The Applicants respectfully assert Pace does not teach these elements and therefore Pace does not disclose each and every element recited in amended claim 77. The Applicants assert that Monthony *et al.* do not provide these missing elements. Monthony *et al.* disclose an electrophoresis method and buffers, but does not provide a disposable cassette having one or more apertures.

In summary, the deficiencies of Pace are not remedied by Monthony *et al.*. Accordingly, the Applicant respectfully requests withdrawal of the rejection of claim 77 under 35 U.S.C. §103(a) as allegedly being unpatentable over Pace in view of Monthony *et al.*.

Double Patenting

U.S. Patent No. 6,379,516

In the Office Action mailed January 3, 2007, claims 18 and 73 were rejected under the judicially created doctrine of obviousness-type double patenting as being allegedly unpatentable over claims 15 and 32 of U.S. Patent No. 6,379,516 in view of Tocci and Elson *et al.*. In addition, claim 77 was rejected under the judicially created doctrine of obviousness-type double patenting as being allegedly unpatentable over claim 30 of U.S. Patent No. 6,379,516 in view of Monthony *et al.*.

The Applicants respectfully disagree that the pending claims 18 and 73 are obvious with respect to the claim 15 and 32 of U.S. Patent No. 6,379,516. In addition, the Applicants respectfully disagree that the pending claims 77 is obvious with respect to the claim 30 of U.S. Patent No. 6,379,516. Furthermore, the Applicants make note of the decision in *Quad Environmental Technologies Corporation v. Union Sanitary District* (946 F. 2d 870), which states:

In legal principle, the filing of a terminal disclaimer simply serves the statutory function of removing the rejection of double patenting, and raises neither presumption nor estoppel on the merits of the rejection.

Therefore, to expedite allowance of the claims, and not acquiesce to the rejection, the Applicants include with this Response a Terminal Disclaimer disclaiming the terminal part of any patent granted on the present application that would extend beyond the expiration date of U.S. Patent No. 6,379,516. Therefore, the double patenting rejections over U.S. Patent No. 6,379,516 are obviated, and Applicants respectfully request that this rejection be removed.

Conclusion

In view of the foregoing amendments and remarks, the pending claims are deemed to be allowable, and their favorable reconsideration and allowance is respectfully requested. It is believed that this response requires the payment of \$120.00 for one (1) month extension of time and a fee of \$130.00 for filing a Terminal Disclaimer. Therefore a total

of \$250.00 is due with this response. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required are hereby authorized to be deducted from, or any overpayment credited to, Deposit Account No. 503994. Should the Examiner have any questions or comments as to the form, content or entry of this response, the Examiner is requested to contact the undersigned at the telephone number below.

Respectfully submitted,

Date May 2, 2007

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